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www.nasa.gov/centers/kennedy/news/snews/spnews_toc.html

INSIDE . . .

Atlantis heads for Hubble on final upgrade mission

By Linda Herridge
Spaceport News

Space shuttle Atlantis' STS-125 mission thundered off Kennedy Space Center's Launch Pad 39A, at 2:01 p.m. EDT May 11, on the fifth and final Hubble Space Telescope servicing mission. Atlantis carried seven crew members, four special payload carriers filled with new instruments, and the equipment and tools needed to upgrade the orbiting observatory.

"It's a great day to go fly," said Shuttle Launch Director Mike Leinbach, to the crew during launch countdown. "On behalf of Kennedy's processing and launch team, I'd like to wish you, your crew and the whole Hubble Space Telescope team a great mission."

Scott Altman leads the STS-125 mission as commander, with Gregory C. Johnson as pilot. Mission specialists are Michael Good, Megan McArthur, John Grunsfeld, Mike Massimino and Andrew Feustel. It is the first spaceflight for Good, McArthur and Feustel.

During the 11-day mission, Grunsfeld, Feustel, Massimino and Good will perform five spacewalks to install new instruments and make repairs or upgrades to other instruments on Hubble. They also will install new gyroscopes, battery modules and thermal blankets to support Hubble through at least 2014.

Two new instruments are the Cosmic Origins Spectrograph and the Wide Field Camera 3. Mission specialists also will make the first ever, in-orbit repairs to the Space Telescope Imaging Spectrograph and the Advanced Camera for Surveys.

The Cosmic Origins Spectrograph, or COS, is the most sensitive ultraviolet spectrograph ever flown on Hubble.

See **HUBBLE,** Page 2

Space shuttle Atlantis roars into the sky above Launch Pad 39A at Kennedy Space Center on May 11 at 2:01 p.m. EDT. During the 11-day flight and five spacewalks, STS-125 mission astronauts will refurbish and upgrade NASA's Hubble Space Telescope to expand its capabilities and extend its operational lifespan through at least 2014.

Photo by NASA/Tony Gray-Tom Farrar

Hubble inspires astronauts to bring momentos

By Steven Siceloff
Spaceport News

From a model of NASA's Hubble Space Telescope to a patch from the New York City Sanitation Department, the STS-125 mission astronauts are marking the flight by taking a wide variety of mementos with them into orbit.

The crew of seven will spend 11 days in space upgrading Hubble during what is expected to be the last shuttle mission to the venerable observatory.

That mission is reflected in several items that make up the astronauts' official flight kit. There's a pocket telescope and a 1.5-inch diameter telescope lens. By comparison, the Hubble mirror is almost eight feet across.

The astronauts also are taking

a basketball that astronomer Edwin Hubble, the namesake of the space telescope, played with while on the Harvard University basketball team. The ball has been deflated so it will not take up as much room inside the shuttle.

While outer space is boundless, the space inside the shuttle is extremely limited. That's why NASA allows astronauts a small amount of room on each mission for collectibles or things they want to carry to mark their achievements. Some of the items reflect organizations astronauts were a part of, while others are taken up to give to friends when they get back.

Several schools are represented in the flight kit, including Clear Springs High School in League City, Texas, Schmitz Park Elementary in Seattle, and Lake Orion High School in Lake Orion, Mich.

Three conductor batons will be stowed inside Atlantis, including one from the Houston Symphony orchestra.

Atlantis also will take a ticket stub from the 2006 U.S. Open and a swimming cap from the U.S. Olympic swim team.

While some of the items look at the recent past as far as Hubble's extraordinary accomplishments, a couple items look forward to NASA's new spacecraft. There is a patch and decal from the Orion crew exploration vehicle project, which is developing the capsule intended to carry astronauts into space after the shuttles retire.

NASA file/1997

The STS-125 mission astronauts are taking scores of momentos up to NASA's Hubble Space Telescope, and will return them to Earth for space enthusiasts and friends. STS-125 is the fifth and final shuttle Hubble Space Telescope servicing mission. Upgrades are intended to keep the telescope operating through at least 2014.

The agency itself also includes scores of souvenirs that are sometimes passed out to workers and managers, or given to world leaders.

There are 625 mission patches, plus 600 American flags.

Another 700 sheets of Space Shuttle Program bookmarks also will fly with Atlantis.

As you might imagine, there are more Hubble commemorative items on STS-125 than anything else. Those are 5,643 patches reflecting different aspects of the telescope program.

From **HUBBLE,** Page 1

"It (COS) is designed to study large-scale structure of the universe and how galaxies, stars and planets formed and evolved," said Debbie Hahn, the STS-125 payload manager. "It will help determine how elements needed for life, such as carbon and iron, first formed and how their abundance have increased over the lifetime of the universe."

The Wide Field Camera 3 will be able to span our vast electromagnetic spectrum. It is the only instrument on Hubble with this capability. Combined with the repair of the Advanced Camera for Surveys, these two instruments could create Hubble imaging history.

The Space Telescope Imaging Spectrograph is the most versatile spectrograph to fly on Hubble. The crew will replace an electronics board in one of the spectrograph's main electronics boxes to restore its power supply.

A new Science Instrument Command and Data handling system will replace the one that failed in Hubble last year and delayed Atlantis' mission.

"Getting to this point has been challenging, but your team (Kennedy), the whole team, everyone has pulled together. We're taking a little piece of all of us into space," said STS-125 Commander Scott Altman to Leinbach, moments before liftoff.

NASA's Hubble Space Telescope was deployed on April 25, 1990, during Discovery's STS-31 mission. Previous servicing missions are Endeavour's STS-61 mission in December 1993; Discovery's STS-82 mission in February 1997; Discovery's STS-103 mission in December 1999; and Columbia's STS-109 mission in March 2002.

Atlantis is scheduled to land at Kennedy's Shuttle Landing Facility at 11:41 a.m. EDT May 22. The payload carriers with old Hubble parts will be removed from Atlantis' payload bay and transported to Goddard Space Flight Center in Greenbelt, Md. The old parts will be studied for thermal property degradation and micrometeorite damage.

Space shuttle Endeavour is on Launch Pad 39B during Atlantis' Hubble mission and is designated STS-400 in the unlikely event it is needed for a rescue flight. After Atlantis lands, Endeavour will roll around to Launch Pad 39A on May 30, for its next flight, STS-127 to the International Space Station.

NASA/Jim Grossmann

The three newest inductees into the U.S. Astronaut Hall of Fame proudly join current members during an induction ceremony May 2, at the Kennedy Space Center Visitor Complex. In front, from left, are George "Pinky" Nelson, one of only six space shuttle astronauts to fly untethered in space using NASA's Manned Maneuvering Unit; William Shepherd, commander of the first crew to live aboard the International Space Station; and James Wetherbee, commander of the longest-docked shuttle mission with space station Mir. More than 20 hall of fame astronauts attended, including Edwin "Buzz" Aldrin, Scott Carpenter, James "Jim" Lovell and Bob Crippen.

Trio of shuttle astronauts join hall of fame

Commanding five of six space shuttle missions and guiding Discovery to within 30 feet of space station Mir might inflate anyone's ego. But not astronaut Jim Wetherbee. His wife, Robin, manages to keep the space explorer grounded. After coming home from a mission, Wetherbee said his wife told him: "Great flight, big boy. Now take out the garbage."

Humility was one of the many things Wetherbee gave thanks for as he joined George "Pinky" Nelson and William Shepherd for induction into the U.S. Astronaut Hall of Fame during a ceremony at the Kennedy Space Center Visitor Complex on May 2.

About 600 people honored the trio as they increased the number of space explorers enshrined in the hall of fame to 73.

Did you know?

With the inductions of George "Pinky" Nelson and Jim Wetherbee, all the original members of the astronaut band Max Q, which was formed in 1987, are now in the U.S. Astronaut Hall of Fame.

This eighth group of space shuttle astronauts was welcomed to the ranks of legendary space pioneers, such as Neil Armstrong, Edwin "Buzz" Aldrin, John Glenn, Alan Shepard, Sally Ride and John Young. Earlier inductees represent the Mercury, Gemini, Apollo, Skylab and Apollo-Soyuz programs.

Along with his space shuttle endeavors, Wetherbee also served as deputy director and director of Flight Crew Operations at NASA's Johnson Space Center in Houston. Today, he is a safety auditor with BP Global, one of the largest energy companies in the world.

"I've learned a lot over my prestigious career," Wetherbee said. "I really appreciate everything I've learned."

Nelson was a member of the first spacewalking team to repair a satellite in Earth's orbit. He flew three space shuttle missions during the 11 years he was in the Astronaut Corps, from 1978 to 1989.

Nelson claims the distinction of being the only American to test-fly the Russian Manned Maneuvering Unit, which he did in 1989 in Moscow.

He now serves as director of the Science, Mathematics, and Technology Education Program at Western Washington University.

"Every giant leap is really made up of many small steps," Nelson said. "I'm proud to have played a part in some of those steps."

Shepherd, a four-time space shuttle astronaut and recipient of the Congressional Space Medal of Honor, was assigned to NASA from the U.S. Navy SEALs community.

Shepherd is widely known for filming segments of "Space Station," an award-winning IMAX 3-D film depicting the ground development and on-orbit construction of the International Space Station.

He commanded the first mission to the space station and lived and worked there for 141 days, from October 2000 to March 2001. Shepherd is now the science advisor to U.S. Special Operations Command, where he manages to develop new technologies and capabilities for the nation's special operations forces.

"I feel very privileged to be part of the Astronaut Corps," Shepherd said, "and to be put in space by the folks who work (at Kennedy) to build vehicles and help operate them."

Also introduced at the ceremony were 24 existing members of the U.S. Astronaut Hall of Fame: John Blaha, Vance Brand, Dan Brandenstein, Bob Cabana, Scott Carpenter, Bob Crippen, Walt Cunningham, Charles Duke, Gordon Fullerton, Owen Garriott, Ed Gibson, Robert "Hoot" Gibson, Richard Gordon, Fred Gregory, Hank Hartsfield, Rick Hauck, Steven Hawley, Jeff Hoffman, James "Jim" Lovell, Bruce McCandless, Edgar Mitchell, Brewster Shaw, Loren Shriver and Al Worden.

Scenes Around Kennedy Space Center

NASA/Jim Grossmann

Rachel Coleman, left, of Signing Time! and children from the Child Development Center teach sign language to workers during Kennedy Space Center's "It's About Ability" event April 30. Coleman talked to workers about not turning their backs on individuals with disabilities.

NASA/Jim Grossmann

Kennedy Space Center marked America's National Day of Prayer in the Training Auditorium on May 7. The theme for this year's observance was "Prayer... America's Hope." Participants prayed about the sacrifices of the armed forces and their families, as well as America's space program.

NASA/Jim Grossmann

Ares I-X Deputy Mission Manager Jon Cowart talks about the Constellation Program's Ares I-X rocket during the KEA-40 Ares I-X Staus in the Kennedy Space Center Training Auditorium on May 6.

NASA/Jim Grossmann

Teachers create a robot using LEGO NXT kits during the "Not Lost in Space! Robots Explore Our Universe" workshop at Kennedy Space Center's Educator Research Center on May 2. Participants maneuvered their robots through rocky terrain, much like the terrain found on distant planets, and performed tasks, such as moving an object from one area to another.

Reader-submitted photo

A Kennedy Space Center worker tells his co-workers about a Florida native that decided to pay a visit to the Parachute Refurbishment Facility on April 29.

Spaceport News wants to know about your special talent

If you have a hidden talent or an interesting hobby, Spaceport News would like to share it. Send your information to **KSC-Spaceport-News@mail.nasa.gov** or mail it to Spaceport News at: IMCS-440, Kennedy Space Center, FL 32988.

Far-out! NASA names treadmill after comedian

By Steven Siceloff
Spaceport News

NASA is serious about its space station crew members exercising in orbit, but that doesn't mean the agency can't have a little fun along the way.

That's why a treadmill engineers had called simply T-2 for more than two years is suddenly famous as the Combined Operational Load-Bearing External Resistance Treadmill, or COLBERT. NASA selected the treadmill's name after comedian and host Stephen Colbert of Comedy Central's "The Colbert Report" took interest during the Node 3 naming census and urged his followers to post the name "Colbert," which received the most entries.

"I think it's great for NASA that Mr. Colbert got his audience interested in the space station," said Curt Wiederhoeft of Wyle. He is the project manager for the treadmill under the bioastronautics contract. "Comedy Central attracts a lot of younger viewers, and the space program's going to need the next generation's support and interest."

Wiederhoeft's team heard about the name a month ago.

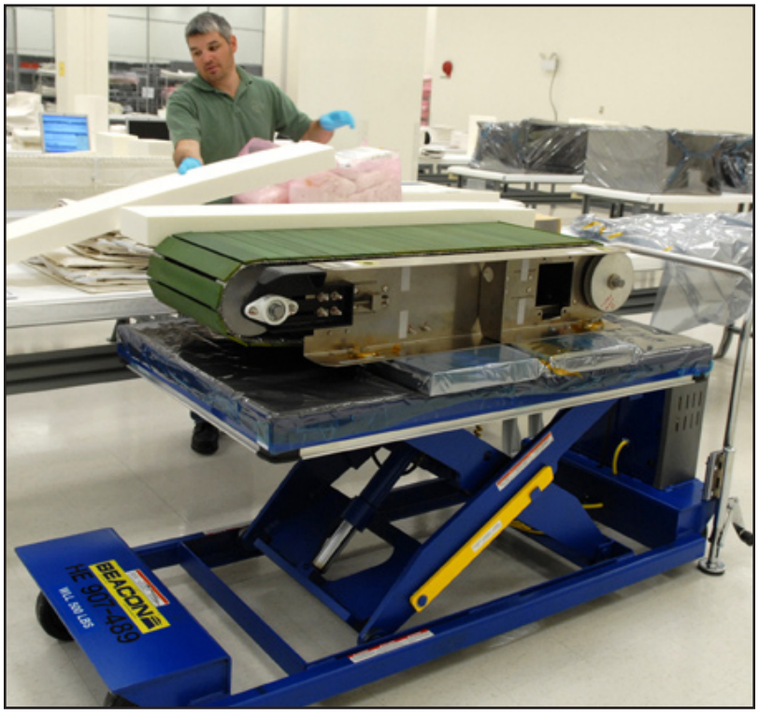
"When they first mentioned it, it was a distraction that we couldn't afford because we were on a tight timetable," he said. "Now that we're down here and it's delivered, it's great. It's a fun thing to think about."

The treadmill, arguably the most famous one ever built, will be the second installed aboard the space station. NASA requires eight hours of exercise each day from the space station crew members as a group. The one already in space can handle the load of three crew members, but would not be enough for an expanded station crew of six.

Engineers started with a medical treadmill available to anyone on Earth. They asked the manufacturer to nickel plate the parts and make some other modifications, but it is fundamentally the same running-in-place device as the others.

The structures around it are a different story.

First, without gravity to hold the runner to the surface of the treadmill, designers call on elastic straps that fit around the shoulders and waist to keep the runner from rocketing across the space station with the first hard step.



NASA/Jack Pfaller

A worker inside Kennedy Space Center's Space Station Processing Facility prepares to pack pieces of the Combined Load-Bearing External Resistance Treadmill, or COLBERT, for its trip to the International Space Station. The treadmill is named after comedian Stephen Colbert, the host of Comedy Central's "The Colbert Report." Space shuttle Discovery, targeted to launch Aug. 6, 2009, and its STS-128 crew will deliver the treadmill to the station. COLBERT will be transferred and installed in the station's Tranquility node after it launches next year.

The straps create a feeling of running while wearing a backpack, Wiederhoeft said.

Next, designers had to work out a way to keep the treadmill from shaking the whole station with every step. That's easy to do on Earth, but the station is floating just like the astronauts and wants to react against any movement. Even small actions can shake up delicate microgravity experiments taking place inside the station's laboratories.

Developing a system to stop the vibrations was the biggest challenge, Wiederhoeft said.

While the first station treadmill relied on a powered system of gyroscopes and mechanisms to reduce vibrations, the COLBERT's Vibration Isolation System was designed to work without power and be more reliable than its predecessor.

The treadmill will rest on springs that are hooked to dampeners. That unit is connected to a standard-sized rack that has been extensively reinforced to handle the power produced by COLBERT users. The rack alone weighs 2,200 pounds, which is its limit.

COLBERT also is louder than the first treadmill, a trade-off Wiederhoeft said is necessary to increase its reliability.

"Noise and reliability are fighting against each other here," Wiederhoeft said. "With a lot more time we could have had both quiet and reliable. We went for reliable, and did what we could with noise."

Now that the treadmill and its support system are designed, built and delivered to NASA's Kennedy Space Center in Florida, another team of engineers is getting it ready to survive the rigorous vibrations of another kind: launch.

COLBERT has been disassembled into scores of parts and separated into more than six bags that will be strapped to racks inside the Leonardo cargo module. Leonardo, one of NASA's multi-purpose logistics modules, or MPLMs, will be carried to the station by space shuttle Discovery during the STS-128 mission later this year.

Famous or not, the packing team intends to make sure everything that is launched reaches the station in good working order.

"If it's the COLBERT, or if it's something else, it's still not going to be useful in orbit if it's broken," said Pete Gauthier, packing engineer for United Space Alliance.

"The difference with something like this is that it's big and it's heavy, so we have to use our biggest bag," he said. "It's easier for the crew if you have all the pieces in one bag, but when you have six bags, you just can't do that."

The astronauts on the station are expected to spend about 20 hours putting the whole thing together, including the vibration system. After that, the only care COLBERT should need is an occasional greasing of its bearings.

COLBERT will reside first inside the Harmony module, which connects the European and Japanese laboratories on the station. The treadmill rack will be on the floor of the node, although in weightlessness the orientation doesn't matter as much as it does on Earth.

Later, COLBERT will move into Tranquility, the station's third node, which is targeted to launch aboard STS-130. Current plans call for COLBERT to be placed against the wall inside Tranquility.

The treadmill is designed to last the life of the station. Although it is built to handle 150,000 miles of running, it will likely see about 38,000 miles during its time in orbit, Wiederhoeft said.

Remembering Our Heritage

Lunar module put through its paces on Apollo 10

This story is the second in a series of four Apollo articles.

By Kay Grinter
Reference Librarian

The 40th anniversary of the Apollo 10 launch May 18, 1969, from Kennedy Space Center's Launch Pad 39B also marks the only time the pad was used to launch a Saturn V rocket. Liftoff was just before midnight.

The fourth crewed launch in the Apollo program, Apollo 10 was a dress rehearsal for the lunar landing to follow. The mission's primary objective was to demonstrate that a lunar module -- the LM -- and a command module -- the CM -- could rendezvous in lunar orbit, one of the last assurances needed before an actual touchdown on the moon.

On their way to the moon, CM Pilot John Young separated the CM called Charlie Brown, from the LM called Snoopy, then docked with the LM while Commander Tom Stafford and LM Pilot Gene Cernan operated a television camera. Back on Earth, television viewers were treated to the first color images from space, including the first space maneuver seen in real time -- the docking of Charlie Brown with Snoopy.

Stafford's piloting skills were put to the test when an anomaly in Snoopy's automatic abort guidance system caused its ascent stage to experience extreme gyrations. By taking over manual control, Stafford was able to re-establish the proper attitude.

During an interview in 1997, Stafford recalled that he and Cernan "got it squared away in about 20 seconds." However, in the excitement, "we forgot we were on hot mike," he said, "and Apollo 10 became X-rated."

Once at the moon, Snoopy coasted in the equivalent of a standard LM insertion orbit of a lunar landing mission, coming within nine miles of the lunar surface.

"We came within about 47,000 feet but did not land," Cernan said during an interview in 2007. "That's the way it was planned, although originally, one time early on in the program, the fourth Apollo flight was going to be the first attempt at landing."

NASA file/1969

Apollo 10 rolls out from Kennedy Space Center's Vehicle Assembly Building to Launch Pad 39B on March 11, 1969. The Saturn V rocket launched at 12:49 p.m. May 18, 1969, and became a dress rehearsal for the Apollo 11 lunar landing mission.

More online

To read astronauts Tom Stafford and Gene Cernan's oral history interviews in their entirety, visit:
www.jsc.nasa.gov/history/oral_histories/participants.htm

Although the Apollo 10 crew did not make the history books for that historic first step, they set a speed record still acknowledged in the "Guinness Book of World Records." The re-entry on their return home May 26, 1969, was at 24,816 mph, the fastest any humans have ever traveled.

Splashdown in the Pacific Ocean was a mere 7,000 yards from its recovery ship, the USS Princeton.

Before modifications to pad 39B began in 1979 for the shuttle program, it also supported four Saturn IB launches: three with Skylab crews aboard and one carrying the American team in the Apollo-Soyuz Test Project.

Now, 20 years later, modifications to pad 39B to support the Ares I rocket that will launch the Orion crew module for NASA's Constellation Program are under way with the construction of three 600-foot-tall lightning towers.

Other work will start after the Ares I-X flight test. The fixed and rotating service structures will be removed, a new emergency egress system constructed, all pad to mobile launcher interfaces modified, a new pad deck to mobile launcher elevator system built, and modern electrical electronic systems installed.

NASA Launch Pad Senior Project Manager Jose Perez-Morales foresees the visual impact these changes will bring.

"These modifications will significantly change the landscape of pad B, especially when the fixed and rotating service structures are removed." Perez-Morales said. "When all the work is complete, this launch pad will look quite a bit different than it did during the Apollo Program."

Camp Kennedy Spring Session Begins June 8

Camp Kennedy Space Center offers children entering second through ninth grade an out-of-this-world experience to explore space. Summer camp sessions are available June 8 through Aug. 14.

Regular tuition is $295 per child, per session. Badged employees and contractors of Kennedy, Cape Canaveral Air Force Station, Patrick Air Force Base and retired Kennedy personnel can save 15 percent on regular camp tuition.

The camp's home base is at the U.S. Astronaut Hall of Fame. Summer camp hours are from 9 a.m. to 4 p.m. with extended early drop-off and late pick-up hours available free for badged employees.

Campers will receive a complimentary Commander's Club Annual Pass – a full year of fun at the Kennedy Space Center Visitor Complex. Also included are lunches and afternoon snacks, an official camp KSC T-shirt, graduation ceremony and certificate of completion.

In celebration of the 40th anniversary of Apollo, a special overnight adventure will be held on Monday, July 20, at the Apollo/Saturn V Center where participants will camp out beneath a Saturn V moon rocket. This special night is available to campers attending the week of July 20-24. Campers' family members also can camp out for $85, plus tax, per person. Cost includes a 40th anniversary T-shirt, dinner, breakfast and lunar-themed snacks.

For more information and registration details, call 321-449-4444 or visit www.KennedySpaceCenter.com.

Submit speaker abstracts for PM Challenge 2010

Do you have a topic of interest to NASA program and project management stakeholders? Submit your speaker proposal for PM Challenge 2010 "Above and Beyond" in Galveston, Texas. Submissions are due Aug. 7. For more information, go to:
http://pmchallenge.gsfc.nasa.gov/speaker2010.htm

Looking up and ahead

Targeted for May 22	Landing/KSC Shuttle Landing Facility: 11:41 a.m.
No earlier than June 2	Launch/CCAFS: Atlas V, LRO/LCROSS; 3:22 p.m.
Targeted for June 13	Launch/KSC: Endeavour, STS-127; 7:19 a.m.
No earlier than June 26	Launch/CCAFS: Delta IV, GOES-O; 6:14 p.m. EDT
July	Launch/CCAFS: Falcon 9; TBD
Target Aug. 6	Launch/KSC: Atlantis, STS-128; TBD
No earlier than Aug. 17	Launch/CCAFS: Delta II, STSS Demo; TBD
No earlier than Aug. 21	Launch/CCAFS: Delta II, GPS IIR-21; TBD
No earlier than Aug. 28	Launch/CCAFS: Delta IV, WGS SV-3; TBD
No earlier than Aug. 30	Launch/KSC: Ares I-X flight test/Launch Pad 39B; TBD
September	Launch/CCAFS: Atlas V, Commercial Payload; TBD
No earlier than Oct. 14	Launch/CCAFS: Atlas V, SDO; TBD
No earlier than Nov. 1	Launch/CCAFS: WISE; TBD
Target Nov. 12	Launch/KSC: Discovery, STS-129; TBD
No earlier than Nov. 12	Launch/CCAFS: Delta IV, GOES-P; TBD
Late November/Early December	Launch/CCAFS: Delta IV, GPS IIF-1; TBD
No earlier than Jan. 23, 2010	Launch/VAFB: Taurus, Glory; TBD
Targeted for February 2010	Launch/KSC: Endeavour, STS-130; TBD
Target Feb. 11, 2010	Launch/KSC: Atlantis, STS-131; TBD
Target April 8, 2010	Launch/KSC: Discovery, STS-132; TBD
Target May 31, 2010	Launch/KSC: Endeavour, STS-133; TBD
Targeted for Fall 2011	Launch/CCAFS: Atlas V, Mars Science Laboratory; TBD

WORD ON THE STREET

The spaceport is home to many types of animals as seen on Page 5. What has been your most memorable encounter with wildlife?

"I walked right up to a bobcat . . . she didn't move and I never took my eyes off of her."
Thomas Partin, with Sierra Lobo Inc.

"I was on Converter Compressor Road and a bobcat and her cubs crossed my path."
Guy Fazzio, with Jacobs Engineering

"I was very sad when I came across an alligator facing off with a manatee."
Cat Houle, with Yang Enterprises Inc.

"I ran into a stubborn pig that refused to get out of the middle of the road . . . turns out he was hurt."
Larry Griffith, with Sierra Lobo Inc.

"On the way to Launch Pad 39B, a bobcat and I stopped and looked at each other for awhile."
Jeff Simmons, with EG&G Technical Services Inc.

John F. Kennedy Space Center

Spaceport News

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